

***Aspergillus ochraceus* 11 alpha-hydroxylase and oxidoreductase**

Abstract

The present invention relates to a novel cytochrome P450-like enzyme
5 (*Aspergillus ochraceus* 11 alpha hydroxylase) and an oxidoreductase (*Aspergillus
ochraceus* oxidoreductase) isolated from cDNA library generated from the mRNA of
Aspergillus ochraceus spores. When the cDNA encoding the 11 alpha hydroxylase
was co-expressed in *Spodoptera frugiperda* (Sf-9) insect cells with the cDNA
10 encoding human oxidoreductase as an electron donor, it successfully catalyzed the
conversion of the steroid substrate 4-androstene-3,17-dione (AD) to 11 alpha-
hydroxy-AD as determined by HPLC analysis. The invention also relates to nucleic
acid molecules associated with or derived from these cDNAs including
complements, homologues and fragments thereof, and methods of using these
15 nucleic acid molecules, to generate, for example, polypeptides and fragments
thereof. The invention also relates to the generation of antibodies that recognizes
the *A. ochraceus* 11 alpha hydroxylase and oxidoreductase and methods of using
these antibodies to detect the presence of these native and recombinant
polypeptides within unmodified and transformed host cells, respectively. The
20 invention also provides methods of expressing the *Aspergillus* 11 alpha
hydroxylase gene separately, or in combination with human or *Aspergillus*
oxidoreductase, in heterologous host cells, to facilitate the bioconversion of steroid
substrates to their 11 alpha hydroxy-counterparts.